

## SECTION 1300 - ASPHALTIC CONCRETE PAVEMENT

- 1301 SCOPE. This section covers asphaltic concrete pavement for roadways and parking areas.
- 1302 GENERAL. Pavement shall be constructed to the lines, grades, dimensions, and details contained herein or as shown on the plans.

Except as modified herein, asphaltic concrete pavement shall conform to Division 600 of the latest edition of the Standard Specifications for State Road and Bridge Construction, Kansas Department of Transportation and shall be as follows:

Surface Course Mix.....BM-2  
Base Course Mix.....BM-2B

Alternate mix designs may be used only where approved by the city engineer.

Composition of Mix. Mix designation BM-2 or BM-2B shall be composed of a combination of aggregates and mineral filler supplements meeting the requirements of Table 5, Section 1103 of the referenced state specifications, providing the mix meets the following composition limits. Not more than twenty-five percent (25%) of the mineral filler shall be present in uncrushed aggregate. The remaining mineral filler shall be present in crushed aggregate or shall be obtained by adding mineral filler supplements. Not more than eight percent (8.0%) by weight of the total mix shall be volcanic ash.

When specified for use in the surface course, mix designation BM-2 shall contain a natural sand of such grading that the portion passing the No. 8 sieve and retained on the No. 200 sieve will not be less than fifteen percent (15%) of the total mix. For this purpose, only sand from an alluvial deposit shall be used.

Immediately prior to the addition of the asphalt, the combined aggregate shall meet the following grading and plasticity requirements:

	<u>PERCENT</u>	<u>RETAINED</u>
	MASTER GRADING	DESIGN JOB-MIX
SIEVE SIZE	LIMITS	TOLERANCES
1"	0	
3/4"*	<b>0-5</b>	
3/8"	<b>10-30</b>	<b>+6</b>
4	---	<b>+6</b>
8	42-72	<b>+6</b>
16	---	<b>+5</b>
30	64-88	<b>+5</b>
50	---	<b>+4</b>
100	---	<b>+4</b>
200 (Wash & Scr)	<b>90-97</b>	<b>+2</b>

Plastic Index                      Max. 6  
Moisture in Final Mix:        Max. **0.5%**

\*For base construction only. For surface courses, 100% shall pass the 3/4" sieve.

In addition, there shall not be less than three percent (3%) nor more than twenty-three percent (23%) material between any two of the following successive sieves:

Numbers 4, 8, 16, 30, and 50.

The asphalt content for each bituminous mix shall be the optimum content plus or minus one-half percent (1/2%) , as determined by the city engineer and shall be based on the Marshall Method test property curves for hot-mix design, to be submitted by the contractor a minimum of five days in advance of the paving operation.

Permissive Recycling. The contractor may use all new materials or a blend of new materials in combination with a maximum of 10% reclaimed asphalt pavement (RAP) in conformance with Section 1103.02(d) of the Standard Specifications for State Road and Bridge Construction, Kansas Department of Transportation.

1303 SUBGRADE PREPARATION. Subgrade preparation for pavement shall be as specified in Section 1200--*Subgrade Preparation*.

1304 TRANSPORTATION OF MIX. The mix shall be transported to the jobsite in vehicles cleaned of all foreign material which may affect the mix. The inside of the truck beds shall be lubricated with a thin oil to prevent the mix from adhering to the bed, but an excess of lubricant will not be permitted. Vehicles shall be provided with covers of sufficient size and weight to

protect the load and to prevent cooling of the mix during transportation to the site in cold weather when required by the engineer. The contractor shall provide a sufficient number of haul vehicles of the proper size, speed, and condition to ensure an orderly and continuous placement operation.

- 1305 PLACING REQUIREMENTS. The bituminous mixture shall be spread and finished reasonably true to crown and grade by a mechanical, self-propelled paving machine. Bituminous mixtures may be spread and finished by other methods only where machine methods are impractical as determined by the engineer.

All bituminous mixtures shall be delivered to the paver at a temperature between 250°F and 325°F. Delivery of the material to the paver shall be at a uniform rate and in an amount well within the capacity of the paving and compacting equipment. No asphaltic concrete shall be placed on frozen or wet subgrade.

The maximum depth of any individual lift shall be four inches (4"). A minimum of one leveling course shall be placed prior to placement of the surface course for asphaltic pavements which consist of a total depth of ten inches (10") or less. A minimum of two (2) leveling courses shall be placed for asphaltic pavements greater than 10 inches (10").

When bituminous materials are being applied, the surface of all structures, curb and gutters, and other roadway appurtenances shall be protected in a satisfactory manner to prevent them from being splattered with bituminous material or marred by equipment operation. In the event that any appurtenances become splattered or marred, the contractor shall, at his own expense, remove all traces of bituminous material and repair all damage, and leave the appurtenances in as good condition as they were before the work began.

All mixed material shall be delivered to the paver in time to permit completion of spreading, finishing, and compaction of the mixture during the daylight hours. **Night time work on projects will not be permitted unless approved by the City Engineer.**

Hot-mix asphalt paving shall be placed when the ambient temperature is 40°F and rising for base pavements and 50°F and rising for surface pavements. Hot-mix asphalt paving shall not be placed when there is frost in the subgrade or at any other time when weather conditions are unsuitable for the type of material being placed without the expressed consent of the engineer. When the ambient temperature falls below 55°F, precautions shall be taken to compact the mix before it cools too much to obtain the required density. In no case shall successive lifts of asphalt be placed until the previous lift has cooled to 150°F or less.

- 1306 MECHANICAL PAVING MACHINES. Mechanical pavers shall be capable of spreading the mix, within the specified tolerances, true to the line, grade, and crown indicated on the contract drawings.

Pavers shall be equipped with quick and efficient steering devices and shall be capable of traveling both forward and in reverse. They shall be equipped with hoppers and distributing

screws which place the mix evenly in front of adjustable screens. They shall be equipped with a vibrating screed.

The screed shall include any strike-off device operated by cutting, crowding, or other action which is effective on mixes at workable temperatures without tearing, shoving, or gouging them and which produces a finished surface of an even and uniform texture. The screed shall be adjustable as to height and crown and shall be equipped with a controlled heating device for use when required.

Pavers shall be capable of spreading mixes without segregation or tearing. They shall also be capable of placing courses in thicknesses of from one-half (1/2) inch to at least three inches (3"), and from widths of eight feet (8') to at least thirteen feet (13'). Extensions and cut-off shoes shall permit changes in widths by increments of six inches (6"), or smaller.

- 1307 COMPACTION REQUIREMENTS. Rollers and other compactive devices shall be operated by competent and experienced roller personnel and shall be kept in operation continuously if necessary so that all parts of the pavement will receive substantially equal compaction. The engineer shall order the mixing plant to cease operations at any time proper rolling is not being performed.

After spreading and strike-off and as soon as the temperature and mix conditions permit the compacting to be performed without excessive shoving or tearing, the mixture shall be thoroughly and uniformly compacted.

Compacting equipment shall consist of both steel-wheeled and pneumatic-tired rollers and shall be on the site of the work prior to placement of the pavement. The compaction equipment shall be self-propelled and capable of smooth starting, stopping and reversing without backlash. Generally, the number and weight of rollers shall be sufficient to compact the pavement mixture to the required density while it is still in a workable condition.

Two-axle tandem steel rollers shall weigh not less than eight tons (8 tons) or more than twelve (12) tons. Three-axle tandem steel rollers shall not weigh less than twelve tons (12 tons). Three-wheeled steel rollers shall weigh not less than eight tons (8 tons) or more than twelve tons (12 tons). All rollers shall be equipped with water tanks and sprinkling devices which shall be used for wetting the rolls to prevent adherence of the placed material.

Light pneumatic-tired rollers shall be constructed to allow loading to provide a gross weight of at least two hundred and twenty-five pounds (225 lbs) per inch of tire tread. Heavy pneumatic-tired rollers shall be constructed to allow loading to provide a gross weight of not less than eight tons (8 tons) and not more than twelve tons (12 tons). The tires on the front and rear axles of all pneumatic-tired rollers shall have smooth treads and shall be staggered to provide complete coverage over the entire area over which the roller travels.

The selection of the type of roller to be utilized in breakdown rolling may be varied to suit mix characteristics and shall be acceptable to the engineer. The final rolling of the top or surface

course shall be accomplished with a steel roller unless otherwise approved by the engineer. In the event a vibratory roller is used for finish rolling, it shall be operated with the vibratory unit in its off position.

During rolling, the roller wheels shall be kept moist with only sufficient water to avoid picking up the material. The speed shall not exceed three miles per hour (3 mph) for steel-wheeled rollers and five miles per hour (5 mph) for pneumatic-tired rollers.

The line of rolling shall not be changed suddenly or the direction of rolling reversed suddenly. If rolling causes displacement of the material, the affected areas shall be loosened at once with lutes or shovels and restored to the original grade of the loose material before being re-rolled. Heavy equipment or rollers shall not be permitted to stand on the finished surface before it has been compacted and has thoroughly cooled.

In laying a surface mix adjacent to any finished area, it shall be placed sufficiently high so that, when compacted, the finished surface will be true and uniform.

Any mixture that becomes loose, broken, mixed with foreign material, or which is in any way defective in finish or density, or which does not comply in all other respects with the requirements set forth herein, shall be removed, replaced with suitable material, and finished by and at the expense of the contractor in accordance with these specifications.

- 1308 BITUMINOUS TACK COAT. Prior to the distribution of bituminous materials, the contractor shall remove all loose materials from the surface by means of approved mechanical sweepers or blowers and/or hand brooms until it is as free from dust as is practicable. Side roads to receive bituminous treatment shall be shaped and bladed at the same time the sub-base is cleaned.

Contact surfaces of curbing, gutters, manholes, and similar structures shall be coated with a thin uniform coating of asphaltic material. The bituminous mixture shall be so placed so that after compaction it will be one-fourth inch (1/4") above the edge of the contact surfaces of such structures.

Joints between old and new pavements or between successive days' work shall be made so as to ensure thorough and continuous bond between the old and new mixtures.

Prior to placing the new pavement against a cut joint or against old pavement, the contact surface shall be sprayed or painted with a thin uniform coat of asphalt material.

The tack coat shall be applied to the areas to be surfaced as soon as practicable after they have been prepared and are sufficiently dry at the rate of from 0.2 to 0.5 gallons/square yard at application temperature. Tack coat shall not be applied in the early morning nor in the late afternoon. Bituminous materials shall be applied by means of approved pressure distributors operated by skilled workmen.

The spray nozzles and spray bar shall be so adjusted and frequently checked that uniform distribution is ensured. The distribution shall cease immediately upon any clogging or interference of any nozzle and corrective measures taken before distribution is resumed. Hand sprays shall be used in tacking small patches or inaccessible areas that have been missed by the distributor.

The asphalt tack shall be entirely fogged over the base course and therefore require no sand blot. If, however, it has not been uniformly distributed, sufficient sand shall be spread over the surface to blot up the excess asphalt and prevent it from picking up. Prior to laying an intermediate or surface course, all loose or excess sand shall be swept from the base.

The contractor shall maintain the tack coat treatment and the surface of the sub-base intact until it has been covered by the surface course. Areas that have been damaged by traffic shall be repaired and shall receive applications of tack coat material in compliance with these specifications. The maintenance and repair of the tack coat shall be done at the contractor's expense.

- 1309 DENSITY AND SURFACE REQUIREMENT. The completed asphaltic concrete pavement shall have a density of greater than or equal to ninety-five percent (95%) of Standard established by the Marshall Density procedure, using a fifty blow method.

All unsatisfactory work shall be repaired, replaced, or corrected. The surface of the final course shall be of a uniform texture and conform to line and grade shown on the plans.

Both density and thickness shall be carefully controlled during construction and shall be in full compliance with plans and specifications. During compaction, preliminary tests, as an aid for controlling thickness shall be made by means approved by the engineer.

Upon request by the engineer, representative samples of the compacted asphalt paving shall be obtained by the contractor under the supervision of the engineer and shall be tested by a suitable independent or municipal testing laboratory as necessary to verify compliance with respective density requirements.

Selection of the independent testing laboratory, the number, timing, location and testing procedures for the representative samples shall be approved by the engineer. The testing laboratory shall submit to the engineer four (4) copies of each report covering the details and results of the tests. All costs for the testing laboratory and all other costs of testing shall be borne by the contractor, unless otherwise specified.

The surface of the final surface course shall not vary from a ten foot (10') straight edge, applied parallel to the centerline, by more than one-fourth inch (1/4").

- 1310 PROTECTION OF PAVEMENT. The contractor shall protect all sections of newly compacted base and surface courses from traffic until they have hardened properly, or as directed by the engineer.

1311 COMPACTION TESTING. At the option of the engineer, compaction testing may be performed in the field using a nuclear density-moisture measuring device to determine the density of the mixture as placed. If as a result of this field testing the engineer determines that further compaction is required, the contractor shall revise his rolling procedure to obtain the density as specified.